FISH & RICHARDSON P.C.

601 Thirteenth Street, N.W.
Washington, D.C. 20005

Frederick P. Fish
1855-1930

W.K. Richardson
1859-1951

Telephone
202 783-5070

Facsimile
202 783-2331

DOCKET FILE COPY ORIGINAL

August 24, 1998

BY HAND DELIVERY

RECEIVED
AUG 24 1998
FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Ms. Magalie R. Salas
Secretary
Office of the Secretary
Federal Communications Commission
1919 M Street, N.W.
Room 222
Washington, D.C. 20554

BOSTON
HOUSTON
NEW YORK
SOUTHERN CALIFORNIA
SILICON VALLEY
TWIN CITIES
WASHINGTON, DC

Re: 1998 Biennial Regulatory Review -- Amendment of Part 18 of the Commission's Rules to Update Regulations for RF Lighting Devices (ET Docket No. 98-42)

Dear Ms. Salas:

Enclosed please find an original and four (4) copies of Reply Comments submitted on behalf of **Fusion Lighting** in the above-captioned proceeding. If you have any questions or concerns regarding this filing please contact me directly.

Very truly yours,

Terry G. Mahn

DXM
Enclosures
cc: Wayne Love, Fusion Lighting

Our File: 03133/008001

90058.W11

No. of Copies rec'd 0+4
List A B C D E

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of 1998 Biennial Regulatory Review -- Amendment of Part 18 of the Commission's Rules to Update Regulations for RF Lighting Devices	ET Docket No. 98-42

REPLY COMMENTS OF

FUSION LIGHTING

Terry G. Mahn, Esq.
FISH & RICHARDSON P.C.
601 13th Street, N.W.
Washington, DC 20005

Counsel for Fusion Lighting

Dated: August 24, 1998

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of 1998 Biennial Regulatory Review -- Amendment of Part 18 of the Commission's Rules to Update Regulations for RF Lighting Devices	ET Docket No. 98-42

To: The Commission

REPLY COMMENTS OF
FUSION LIGHTING

Fusion Lighting (Fusion), by its counsel, hereby submits these reply comments in the Commission's Notice of Proposed Rulemaking, FCC 98-53 (released April 9, 1998) (NPRM).

This proceeding, having evolved from narrowly-drawn waiver petitions filed by GE and Fusion, set forth the following specific issues for public comment: whether and to what extent conducted emissions limits should be relaxed for RF Lighting; what radiated emission limits above 1000 MHz should apply to RF lighting; and whether in-band limits might be needed to facilitate sharing with Mobile Satellite Service (MSS), a co-primary user in the 2.45 GHz band. Nearly all of the comments received favor amending Part 18 to encourage the development and use of these new RF lighting technologies. However, certain manufacturers of unlicensed RF devices (and their trade

associations) have gone well beyond the scope of this rulemaking by attempting to covert it into a debate on the merits of Part 15 versus ISM in the 2.45 GHz band.

This is a false debate which should be firmly and unequivocally dismissed by the Commission. ISM device priority over unlicensed Part 15 devices operating "in-band" is an historic regulatory principle that is firmly rooted in international law and spectrum policy. To invite any debate on this issue even in the context of a particular ISM technology, without proper notice and opportunity for comment by the domestic and international ISM communities is not just unfair but would be in patent derogation of the Administrative Procedures Act (APA). Insofar as this proceeding is clearly not the proper vehicle for such broad debate, the Commission's record must reflect this fact.

Certain parties also question the Commission's two-tier regulatory approach to RF lighting and assert that only consumer limits should apply to such devices. Like the Part 15 vs. ISM debate, this argument also overlooks the historic international treatment of ISM and, if adopted, would put the U.S. fundamentally out of step with the national regulatory authorities in other industrialized countries. For these reasons, the recommendations offered by Fusion herein are designed to be compatible with the international regulatory scheme for ISM. Conducted and radiated limits (above 1000 MHz) should be modeled on the international IEC/CISPR standards, and

in-band limits must not be adopted for RF lighting or other ISM devices. By adopting these recommendations into the Part 18 rules, the US will move closer toward harmonization with the international regulatory community, benefiting manufacturers and users of these devices worldwide.

I. Conducted Limits Should Be Harmonized with IEC/CISPR Standards for ISM Devices

As noted in its earlier comments, Fusion was surprised and disappointment that the Commission was backing away from NTIA's recommendation of February 12, 1997, supporting the conducted limit relaxation proposed in Fusion's original waiver request. The high cost of line filtering, which outweighed the marginal benefits to spectrum users then, continues to outweigh those benefits now. This fact should be evident to the Commission and others given the absence of interference from the millions of domestic and industrial microwave ovens which are <u>not</u> required to be filtered, and which use the same RF source and produce conducted emissions similar to the Fusion lamp.[1/]

Nonetheless, a handful of commentors objected to any relaxation of conducted limits for RF lighting. The Coast Guard, for example, concerned about lighting on ships, requested warning language that Fusion had already agreed to in its discussions

---

[1/] Fusion notes again that the Commission's recommended limits were based on a small sampling of domestic ovens and involved no **industrial** oven testing. Yet it is these industrial ovens whose emissions are considerably higher than domestic ovens that will be located in the same environments as Fusion lamps.

with NTIA.[2/] The American Radio Relay League, Inc. (ARRL) and the National Association of Broadcasters (NAB) predictably voiced their reflex opposition to any relaxation of conducted limits in spectrum allocated to their members' services.[3/] These groups go to great lengths to distinguish RF lighting from domestic microwave ovens by asserting that ovens operate intermittently, indoors, unclustered and in non-elevated locations where line conducted emissions are less of a concern to amateur and AM users. What both ARRL and NAB fail to appreciate, however, is that the Fusion lamps for which conducted limit relaxation is sought will not be marketed for domestic use.[4/] These lamps are high powered devices that are incapable of being safety (UL) listed for home use and thus, will only be marketed to commercial and industrial users in locations far removed from amateur and AM radio receivers. In the event that Fusion develops a lamp for future domestic use, Part 18's consumer limits would apply.

NAB goes further, attacking the Commission's historical two-tier approach to RF lighting regulation by claiming that AM radio will suffer interference even in commercial environments. Not

---

[2/] An acceptable form for such warning language would be a statement in the user instructions. Device labelling, as the Coast Guard suggests in its Comments, is neither practical nor warranted.

[3/] See Comments of American Radio Relay League, Inc. at 9, and Comments of National Association of Broadcasters at 3.

[4/] Moreover, NTIA studied microwave oven operation in cities and found that, in the aggregate, such operations are continuous. Further, it should be noted that microwave ovens can be found in most offices, which qualify as elevated locations.

surprisingly, NAB offers no evidence of AM reception in the workplace nor of the alleged interference problems that are unique to such environments.[5/] Indeed NAB's arguments are technically suspect in that they overlook the severe attenuation that AM suffers when penetrating commercial structures and the fact that such environments contain shielded conduits that greatly attenuate conducted emissions from RF sources. NAB's analysis also assumes, incorrectly, that Fusion lamps will be in such close proximity to each other that their RF properties will be additive thereby compounding AM interference concerns. Here again, NAB demonstrates little appreciation for the product under discussion which is not an office lighting device but a volume light source designed to illuminate very large areas.[6/]

In asking the Commission to eliminate its two-tier regulatory approach to all of Part 18,[7/] NAB is seeking to push the U.S. away from international ISM harmonization. While this might serve the parochial interests of NAB's constituency, it would disserve the interests of the American public by raising costs (or denying outright) ISM sources and ISM-processed products currently available on world markets. Instead, the

---

[5/] For over two decades the Commission has maintained a two-tier approach to digital device regulations precisely because consumer radio services like AM are not a workplace issue.

[6/] One Fusion lamp is capable of replacing 75 100 watt incandescent bulbs at 25% of the electrical power.

[7/] See Comments of National Association of Broadcasters at 3.

Commission should use the opportunity of this rulemaking to embrace the regulatory approach set forth in IEC/CISPR 11.

In the spirit of harmonization, therefore, Fusion is willing to modify its initial request for a relaxation of the conducted limits. Initially, Fusion sought a relaxation of approximately 25 to 35 dB whereas the Commission proposes only 10 dB. As a compromise and in an effort to harmonize Part 18 with international standards, Fusion now requests that the Commission adopt the Class A and B conducted limits set forth in IEC/CISPR 11[8/] for Part 18 RF lighting devices. This will provide Fusion and other RF lighting manufacturers with a single worldwide EMC standard for their products to the benefit of manufacturers, users and the public at large.

II. Radiated Emissions Above 1000 MHz Should Be Harmonized with IEC/CISPR 11 Standards Currently Under Development

In response to the Commission's request for comment on limits above 1000 MHz for RF lighting devices, Fusion urged that Part 18 be harmonized with the CISPR 11 standards currently under development.[9/] As Fusion noted, this will provide manufacturers a common worldwide standard for product design, promote mutual recognition of national authorizations, and benefit users through lower product costs. In any event, Fusion observed that because RF lighting is very similar, both technically and operationally,

---

[8/] See Tables 2A and 2 B, IEC/CISPR 11 (3rd ed. 1997).

[9/] See Comments of Fusion Lighting at 7-9.

to ISM rather than ITE, it should be treated the same as other ISM products for which the limits in Section 18.305 apply.

Several parties have argued for tighter limits than those proposed by the Commission as a means of protecting unlicensed devices operating in-band[10/] or to protect SDARS service in the 2300-2345 MHz band.[11/] Neither group, however, provides a credible analysis to support their position.

The wireless LAN manufacturers, for example, seek to obtain through the tightening of out-of-band limits that which they cannot obtain in-band -- namely, spectrum rights over RF lighting. Their attempts to carve RF lighting out of the ISM tradition runs counter to the underlying purpose of the international ISM allocations and to the recent efforts bringing ISM-band RF lighting squarely within the international ISM regulatory scheme.[12/]

SDARS commentors assert the potentially harmful effects of RF lighting devices on SDARS reception, with Satellite CD Radio (CD Radio) actually claiming that adoption of the proposed standards will "lead to chaos."[13/] CD Radio notes, in this regard, that unlike microwave ovens which operate indoors and

---

[10/] See, e.g., Comments of the Wireless LAN Alliance at 3; Comments of the Part 15 Coalition at 3, and; Comments of the IEEE 802 LAN/MAN Standards Committee at 4.

[11/] See Comments of Satellite CD Radio, Inc. at 9-12, and Comments of the American Mobile Radio Corporation at 2.

[12/] See Comments of Fusion Lighting at 2-3.

[13/] Comments of Satellite CD Radio at 8.

intermittently, RF lighting will be installed primarily outdoors in elevated locations and will operate on a semi-continuous basis. CD Radio also contends that any distinction between consumer and non-consumer makes "no sense" in the context of SDARS[14] and requests that no limits be adopted until additional information is provided on the interference potential of RF lighting devices. The American Mobile Radio Corporation (AMRC) makes similar assertions and includes a technical analysis to support its view that the Commission's out-of-band proposals will create "destructively high levels" of interference to SDARS.[15]

What CD Radio and AMRC fail to understand, however, is that the Fusion lamp has already been tested and verified to the Part 18 limits for sale in the U.S., with the limits in Section 18.305 "voluntarily" applied to out-of-band emissions. Thus, should the Commission fail to act as CD Radio requests, Section 18.305 provides the default limits for the verification of future RF lighting devices.

Whether the Part 18 limits are sufficient to prevent interference to SDARS is a question that the SDARS commentors must also address to the myriad electronic devices that also emit in the SDARS bands. Indeed, only a few dB separate the Part 15 digital device limits from the Part 18 limits in the SDARS bands. Numbering in the millions and dotting streets and highways throughout the country are digital device emitters (i.e.,

---

[14] Id. at 13.

[15] Comments of the American Mobile Radio Corporation at 2.

microprocessors) used to control traffic signals, automated road signs, toll machines, vehicle counters, gas dispensers, ATMs, and dozens of similar applications. Together with the various on-board (and in-board) microprocessor-based systems found in most vehicles today, these devices continuously bathe the SDARS spectrum with the same low levels of RF that CD Radio and AMRC find so objectionable.[16/] And unlike RF lighting, which operates primarily in the evenings, these digital systems are on the air continuously. In other words, if the SDARS community is truly concerned about out-of-band interference levels it makes little sense to single out RF lighting from the millions of other emitters in the current environment.

As for the attempt to distinguish RF lighting from microwave oven operation, Fusion notes, as it did in its waiver petition, that the NTIA carefully studied microwave oven operation in cities and found that, in the aggregate, such operations are continuous -- not intermittent.[17/] Finally, in addition to pole-mounted LANs and other "hanging" digital devices with which DARS already have to contend, it should be added that microwave ovens are found in most offices which also qualify as "elevated locations".

[16/] In addition, emerging services, such as the wireless "local loop" and LAN providers who have been active in this docket, operate in the 2.45 GHz band and are subject to the same out-of-band limits that would apply to RF lighting.

[17/] See NTIA Report 94-303-1, 94-303-2 and 95-323 (August 1995).

SDARS, as Fusion noted in its comments, is an international allocation whose interference concerns (from all unlicensed emitters) are currently under study by IEC/CISPR and the ITU.[18/] It would be a mistake, therefore, for the Commission to act unilaterally while these matters are under consideration. To promote uniformity in the treatment of RF lighting emissions, including questions of interference to SDARS, Fusion urges the Commission to follow the lead of IEC/CISPR and adopt the same limits for out-of-band emissions above 1000 MHz that are currently in their final stage of approval on international standards.[19/]

III. In-Band Limits are Beyond the Scope of This Proceeding

The Commission requested comments as to whether in-band limits are necessary to facilitate sharing of the 2450 MHz ISM band between RF lighting technology and MSS.[20/] As Fusion pointed out, however, RF lighting does not present an interference potential to MSS that is different from the concerns that have already been fully considered in the MSS docket.[21/] Indeed, one can infer that the MSS interests agree with Fusion's

---

[18/] See Sub-committee B: Interference Relating to Industrial, Scientific and Medical (ISM) Radio Frequency Apparatus, *Limits and Methods of Measurement in the Bands 1 to 18 GHz*, Document CISPR/B/204/CDV (July 1998) (companion document to the official U.S. document submitted to Task Group 1/5 I.T.U.).

[19/] See Comments of Fusion Lighting at 7.

[20/] NPRM at ¶ 13.

[21/] Comments of Fusion Lighting at 12.

assessment as no adverse comments have been submitted in this proceeding.

Nonetheless, a number of unlicensed device manufacturers have mounted a coordinated effort to assert that in-band limits are necessary to protect their devices.[22/] Unfortunately, these comments collectively fail to address the Commission's core concern, which is whether RF lighting presents an interference concern to the licensed MSS service. Accordingly, these comments are irrelevant to this proceeding.

This present situation is analogous to the earlier RF lighting docket[23/], wherein the Commission considered adopting radiated limits below 30 MHz for RF lighting devices out of concern over interference to licensed services. Then as now, various unlicensed device manufacturers sought to convince the Commission to adopt technical limits for RF lighting based on potential interference to Part 15 devices.[24/] The Commission dismissed those comments for lack of standing, stating its

---

[22/] See, e.g., Comments of the Part 15 Coalition at 4; Comments of Metricom at 2; Comments of Symbol Technologies, Inc. at 5; Comments of 3Com Corporation at 5, and; Reply Comments of Spectralink Corporation at 4.

[23/] Gen. Docket No. 83-806.

[24/] See FCC Regulations Concerning RF Lighting Devices (Gen Docket No. 83-806), *Opinion and Order*, 2 FCC Rcd 6775 at ¶ 17.

bedrock principle that:

> It is not necessary to discuss these [Part 15] comments except to point out that, under §15.[5] of the Rules, users of Part 15 devices, except those used as part of an authorized radio service, e.g., TV and FM receivers, must accept any interference they receive from any type of device including those operating under Part 18 of the Rules.[25/]

The Commission would later characterize such comments as unresponsive, irrelevant, and per Section 1.425, beyond the scope of that proceeding.[26/27/]

Notwithstanding, the unlicensed device manufacturers press misleading and meritless arguments in an effort to rekindle their issue. Several, for example, claim that the Commission "encouraged" the development of unlicensed spread spectrum

---

[25/] Id.

[26/] See FCC Regulations Concerning RF Lighting Devices (Gen. Docket No. 83-806), *Memorandum Opinion and Order*, 3 FCC Rcd 6097, 6097-8 at ¶ 7, in which the Commission addressed a challenge to its dismissal of the Part 15 comments.

[27/] Moreover, consideration of Part 15 interference as a basis for Commission action in the instant proceeding would violate the Administrative Procedure Act because such consideration was not identified in the NPRM. Nor can such consideration be characterized as a "logical outgrowth" of the NPRM, because no person could reasonably anticipate that the Commission might consider Part 15 interests relative to ISM (as they have no recognized spectrum rights under the Commission's Rules). Unlike the situation here, the "safe harbor" provisions adopted in the Location Monitoring Service proceeding (PR Docket No. 93-61; discussed *infra*) to accommodate Part 15 users was deemed by the Commission to be a "logical outgrowth" of that proceeding only because the coexistence of Part 15 was identified in the Notice. See Amendment of Part 90 of the Commission's Rules to Adopt Regulations for Automatic Vehicle Monitoring Systems (PR Docket No. 93-61), *Memorandum Opinion and Order and Further Notice of Proposed Rule Making*, 12 FCC Rcd 13942, 13959 at ¶ 42.

systems in the 2400-2483.5 MHz band[28] when, in fact, the Commission did no more than accommodate spread spectrum operations in the ISM bands under Part 15. In its Order adopting the Part 15 spread spectrum rules the Commission made clear the dominant/servient relationship between ISM (including RF lighting, microwave ovens and other processing equipment) and Part 15 when it stated:

> Spread spectrum systems are allowed to operate within the ISM bands only on a noninterference basis ... [and] must not cause any harmful interference to these operations and must accept any interference which these systems may cause to their own operations.[29][30]

Almost prophetically, the Commission adopted an output power for spread spectrum devices much lower than it initially had proposed in that proceeding due to the concern, expressed by GE, that the "steady encroachment on [the ISM] bands by [such] services will eventually lead to petitions from these other users for protection from interference from ISM devices."[31] Just as GE and others predicted, the unlicensed device manufacturers having

---

[28] See, e.g., Comments of Metricom, Inc. at 2, and Comments of the Part Coalition at 2.

[29] Authorization of spread spectrum and other wideband emissions not presently provided for in the FCC Rules and Regulations (Gen. Docket No. 81-413), *First Report and Order*, 58 RR 2d 251, 256 at ¶ 24. See also Amendment of Parts 2 and 15 of the Commission's Rules Regarding Spread Spectrum Transmitters (ET Docket No. 96-8), *Report and Order*, 12 FCC Rcd 7488, 7496 at ¶ 14.

[30] This warning that interference from ISM may occur and must be tolerated is incorporated into the Part 15 spread spectrum rules. See Note following 47 C.F.R. 15.247(h).

[31] Id. at ¶¶ 25 and 26. Fusion expressed these same fears in its Comments in ET Docket No. 96-8. See Comments of Fusion Lighting (ET Docket No. 96-8) at 1-3.

had a "taste" of the ISM band are again seeking protection from ISM usage.

Several of these parties also cite to the Commission's 1994 "below 5 GHz" reallocation proceeding as an example of how the Commission has taken into account the importance of Part 15 operations in rulemaking proceedings.[32/] The issue in the 5 GHz proceeding, however, was whether Part 15 operations should be eliminated from the 2402-2417 MHz band in favor of licensed commercial services.[33/] Indeed, the Commission made clear in that proceeding that its action "does not affect use of [the 2402-2417 MHz] band by ISM equipment", and that other "radio services operating in this band must accept harmful interference which may be caused by ISM applications."[34/]

The unlicensed device manufacturers also cite to the Location and Monitoring Service (LMS) proceeding (PR Docket No. 93-61) as a "landmark decision" which establishes that the

---

[32/] Metricom, for example, misleadingly implies that the 5 GHz proceeding "indicat[es] that since the Commission encouraged the development of spread spectrum unlicensed systems in the 2400 MHz Band, among others, the industry has responded with a variety of products ..." (Metricom comments at 6 n.7). In fact, the paragraph in the 5 GHz proceeding to which Metricom (and others) refers was merely the Commission's summary of the LAN industry's comments in that proceeding. See also Comments of Part 15 Coalition at 2, and Comments of Symbol Technologies, Inc. at 2.

[33/] See Allocation of Spectrum Below 5 GHz Transferred from Federal Government Use (ET Docket No. 94-32), *Notice of Proposed Rule Making*, 9 FCC Rcd 6779, 6782 at ¶ 18, and *First Report and Order and Second Notice of Proposed Rule Making*, 10 FCC Rcd 4769, 4785 at ¶ 30.

[34/] *First Report and Order and Second Notice of Proposed Rule Making* (ET Docket No. 94-32), at 4787 n.77. See also id. at ¶ 25.

Commission may interpret Section 15.5 so as to "balance" the interests of various parties "sharing" a band to protect Part 15 operations from harmful interference.[35/] This is a gross distortion of the LMS proceeding wherein the Commission actually sought to "accommodate" Part 15 operations "short of removing Part 15 users ... from the band."[36/] Moreover, LMS is a secondary service so that whatever methods used by the Commission to accommodate Part 15 stopped well short of establishing Part 15 equality with primary band users like ISM.[37/]

In short, an inspection of the historical record reveals that in every regulatory proceeding involving ISM usage, the Commission has consistently underscored the ironclad principle

---

[35/] See, e.g., Comments of 3Com Corporation at 3, and Comments of Symbol Technologies, Inc. at 3.

[36/] Amendment of Part 90 of the Commission's Rules to Adopt Regulations for Automatic Vehicle Monitoring Systems (PR Docket No. 93-61), *Notice of Proposed Rule Making*, 77 RR 2d 114, 119 at ¶ 24 (*misprinted* in 8 FCC Rcd 2502, 2506-07 at ¶ 24).

[37/] Specifically, the LMS "safe harbor" provisions merely "serve to alert LMS operators that they can not claim harmful interference has occurred from most spread spectrum operations." Amendment of Parts 2 and 15 of the Commission's Rules Regarding Spread Spectrum Transmitters (ET Docket No. 96-8), *Report and Order*, 12 FCC Rcd 7488, 7518 at ¶ 62. See also Amendment of Part 90 of the Commission's Rules to Adopt Regulations for Automatic Vehicle Monitoring Systems (PR Docket No. 93-61), *Memorandum Opinion and Order and Further Notice of Proposed Rule Making*, 12 FCC Rcd 13942, 13956 and 13958 at ¶¶ 33 and 40. Although the Commission established test requirements for wideband LMS designed to prevent "unacceptable levels" of interference to Part 15 devices (codified in 47 C.F.R. § 90.353(d)), the Commission made it clear that such requirement was not intended to establish a "new standard" for Part 15 operations, but was designed merely to ensure that LMS equipment designers "take into consideration a goal of minimizing interference to existing deployments of Part 15 devices." Id. at ¶¶ 68-9.

that ISM devices enjoy preeminent status in ISM bands and that all other users must operate in the ISM bands subject to the possibility of interference from such equipment.[38/]

IV. Miscellaneous Issues

Finally, Fusion is compelled to correct the record regarding a number of misleading and false assertions made concerning its lighting device. Metricom, for example, asserts that it performed field testing of the Fusion lamp at the Department of Energy (DOE) on February 6, 1998, when in fact, Metricom's attached emission plot shows actual testing was performed February 6, 1996, when the Fusion lamp was an early prototype version.[39/] As Fusion informed Metricom at the time, the DOE lamp was not intended for production and, therefore, does not represent the current product. Accordingly, Metricom's assertions relating to its "field testing" of the Fusion lamp are to be ignored.

Metricom also asserts that Fusion's device exhibits RF radiation in excess of the FDA limits set forth in 21 C.F.R.

[38/] Indeed, the LMS proceeding made clear the superior status of ISM to Part 15, just as did every other proceeding cited by the manufacturers of unlicensed devices. See Amendment of Part 90 of the Commission's Rules to Adopt Regulations for Automatic Vehicle Monitoring Systems (PR Docket No. 93-61), *Report and Order*, 10 FCC Rcd 4695, 4712 at ¶ 31.

[39/] The lamp operating at the DOE during 1996 was an early prototype utilizing two magnetrons (one operating at a frequency of approximately 2.465 GHz, and one operating at approximately 2.435 GHz) as opposed to the single magnetron used in current models.

§ 1030.10(c)(1) and, therefore, the Commission should "introduce some in-band limits."[40/] Here again, because Metricom's RF radiation calculations were based on the 1996 prototype they are similarly irrelevant.[41/] Nonetheless, the Commission should know that because Fusion Lighting is concerned about the possibility of human exposure to microwave energy, it voluntarily tests each lamp sold to ensure that it complies with the microwave oven specifications of less than 1 milliwatt per square centimeter prior to shipping.[42/] Fusion even goes further by requiring its OEMs to supply verification reports of the radiated emissions of their fixtures which incorporate the Fusion lamp, before lamps are shipped to them.

The IEEE 802 LAN/MAN Standards Committee (IEEE) and a number of other commentors raise a test issue by requesting that RF lighting be required to meet the same 20 dB "peak to average" ratio required for Part 15 devices. Essentially, IEEE contends that because RF lighting devices exhibit peak power levels far in excess of their average power, citing microwave ovens as an example, but asserts that whereas the IEEE LAN receiver standard accounts for such ovens, it does not account for RF lighting

---

[40/] Comments of Metricom, Inc. at 9-10.

[41/] Metricom is also mistaken as to the power density limits applied to microwave lighting. According to FDA/CDRH, the limits cited by Metricom in 21 C.F.R. § 1030.10(c)(1) apply only to microwave ovens.

[42/] Compliance with this specification has been confirmed not only by independent test laboratories, but also by personnel at FDA/CDRH.

devices because of their supposed proliferate deployment. However, given the millions of microwave ovens on the market, operating in all environments and at all hours of the day, IEEE's "proliferate deployment" argument should be dismissed on its face. Even so, there is no basis for treating an ISM device like a Part 15 radiator with respect to these ratios. ISM devices emit high peak power RF to perform an essential non-communication function, whereas short range devices emit high peak power to approximate long range radio. Thus, the 20 dB peak to average measurement requirements are designed to limit the peak power (and the interference potential) of low power, short range communication devices. Moreover, limiting peak emissions from an ISM source is difficult to achieve and is of dubious cost/benefit justification as compared to low power devices.

Finally, Fusion wishes to correct a gross miscalculation submitted in the Technical Appendix to the Comments of Adtran, Inc. Specifically, the efficiency of a Fusion lamp is such that the light produced by 1.4 kW of the Fusion lamp equals the visible light provided by 7.5 kW of incandescent lighting (a factor of 5.357). Using Adtran's figures, a 40,000 square foot facility that requires 300,000 W of incandescent lighting power would need only 56,000 W of Fusion lighting (300,000 / 5.357). Since the Fusion lamp operates at 1.4 kW (not 100 W as asserted by Adtran), Adtran's hypothetical facility requires, at most, only 40 Fusion lamps -- not the 750 asserted by Adtran.

CONCLUSION

Based on the foregoing reply comments, Fusion urges the Commission to harmonize its Part 18 rules for RF lighting with IEC/CISPR 11, and to reaffirm clearly that in-band limits are inappropriate for ISM devices of any kind.

Respectfully submitted

Terry G. Mahn, Esq.
Fish & Richardson P.C.
601 13th Street, N.W.
Washington, DC 20005

Counsel for Fusion Lighting

August 24, 1998

89635.W11

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
1998 Biennial Regulatory Review -- Amendment of Part 18 of the Commission's Rules to Update Regulations for RF Lighting Devices	)	ET Docket No. 98-42

CERTIFICATE OF SERVICE

The undersigned hereby swears that on August 24, 1998, a copy of the foregoing REPLY COMMENTS OF FUSION LIGHTING was deposited in the U.S. first class mail, postage prepaid, addressed to the following:

J.D. Hersey Jr.
Chief
Spectrum Management Division
U.S. Department of Transportation
United States Coast Guard
G-SCT-2
2100 2nd Street, SW
Washington, DC 20593-0001

Donald Zeifang
Counsel to General Electric Company
Baker & Hostetler LLP
1050 Connecticut Avenue, NW
Suite 1100
Washington, DC 20036

Henry M. Rivera
Larry S. Solomon
Counsel to Metricom, Inc.
SHOOK, HARDY & BACON LLP
1850 K Street, NW
Suite 900
Washington, DC 20036

Timothy Feldman
NEMA
1300 North 17 Street
Suite 1847
Rosslyn, Virginia 22209

Lennie McMillian
Vice President
ADTRAN, Inc.
901 Exployer Blvd.
Huntsville, AL 35806

Christopher D. Imlay
Booth, Freret, Imlay & Tepper, P.C.
5101 Wisconsin Avenue, NW
Suite 307
Washington, DC 20016-4120

Henrietta Wright
Mary J. Dent
W. Kenneth Ferree
Goldberg, Godles, Weiner & Wright
1229 Nineteenth Street, NW
Washington, DC 20036

Mitchell Lazarus
Fletcher, Heald & Hildreth, P.L.C.
1300 North 17th Street, 11th Floor
Arlington, Virginia 22209

Nadja S. Sodos
Gurman Blask & Freedman, Chartered
1400 Sixteenth Street, NW
Suite 500
Washington, DC 20036

Robert C. LaGasse, Executive Director
International Microwave Power Institute
10210 Leatherleaf Court
Manassas, Virginia 20111-4245

James T. Carlo
Texas Instruments
9208 Heatherdale Drive
Dallas, Texas 75234

Henry L. Baumann
Jack N. Goodman
Barry D. Umansky
National Association of Broadcasters
1771 N Street, NW
Washington, DC 20036

Richard E. Wiley
Carl R. Frank
Jennifer D. Wheatley
Wiley, Rein & Fielding
1776 K Street, NW
Washington, DC 20006-2304

Bruce D. Jacobs
Stephen J. Berman
Fisher Wayland Cooper
Leader & Zaragoza L.L.P.
2001 Pennsylvania Avenue, NW
Suite 400
Washington, DC 20006

Donald I. Sloan
Senior Vice President of Engineering
Aironet Wireless Communications, Inc.
P.O. Box 5292
367 Ghent Road
Suite 300
Fairlawn, Ohio 44334-0292

Rosalind Fagelson

89635.w11